I CLAIM:

5   1. A fracture trend identification method adapted for analyzing compressional 2-D

seismic data to identify zones within rock formations containing open natural fractures,

comprising the steps of:

(a) receiving seismic data and identifying zones of faulting in an area of interest;

10

(b) identifying seismic events in said seismic data corresponding to a formation of

interest;

(c) extracting seismic attribute data from various zones of said seismic events and

15   identifying frequency anomalies by interpreting the extracted seismic attribute data for the

various zones of said seismic events;

(d) identifying and removing any potential false positive frequency anomalies; and

20   (e) confirming any remaining ones of said frequency anomalies not removed during the

removing step and ranking the remaining confirmed frequency anomalies.

2. The method of claim 1, wherein the receiving and identifying step (a) comprises the

steps of:

25

visually quality controlling the received seismic data;

generating variance sections; and

30   examining the variance sections to identify zones of high variance; and

identifying faulting in the area of interest in response to the examining step.

3. The method of claim 1, wherein the identifying step (b) of identifying seismic events corresponding to a formation of interest comprises the steps of:

5

extracting a seismic wavelet, and

performing a well to seismic tie through the generation of a synthetic.

10   4. The method of claim 1, wherein the extracting step (c) of extracting seismic attribute data from various zones of said seismic events comprises the step of generating seismic variance and dominant frequency attributes.

5. The method of claim 4, wherein the identifying step (c) of identifying frequency

15   anomalies by interpreting the extracted seismic attribute data for said various zones of said seismic events comprises the steps of:

posting attribute values on a ribbon posting map; and

20   examining these values for rapid shifts in frequencies from higher to lower frequencies.

6. The method of claim 1, wherein the identifying step (d) of identifying and removing any potential false positive frequency anomalies comprises the steps of:

25   extracting and examining a dominant frequency for a near surface seismic event; and

comparing said dominant frequency with the dominant frequencies of the zone(s) of interest.

7. The method of claim 1, wherein the confirming step (e) for confirming any remaining ones of said anomalies not removed during the removing step and ranking the remaining confirmed anomalies comprises the step of:

5   extracting and examining the seismic frequency spectrums from selected zones above, below and including any frequency attenuation zones.

8. A program storage device readable by a machine storing a set of instructions executable by the machine to perform method steps for analyzing compressional 2-D

10   seismic data to identify zones within rock formations containing open natural fractures, said method steps comprising:

(a) receiving seismic data and identifying zones of faulting in an area of interest;

15   (b) identifying seismic events in said seismic data corresponding to a formation of interest;

(c) extracting seismic attribute data from various zones of said seismic events and identifying frequency anomalies by interpreting the extracted seismic attribute data for the

20   various zones of said seismic events;

(d) identifying and removing any potential false positive frequency anomalies; and

(e) confirming any remaining ones of said frequency anomalies not removed during the

25   removing step and ranking the remaining confirmed frequency anomalies.

9. The program storage device of claim 8, wherein the receiving and identifying step (a) comprises the steps of:

30   visually quality controlling the received seismic data;

27

generating variance sections; and

examining the variance sections to identify zones of high variance; and

5

identifying faulting in the area of interest in response to the examining step.

10. The program storage device of claim 8, wherein the identifying step (b) of identifying seismic events corresponding to a formation of interest comprises the steps of:

10

extracting a seismic wavelet, and

performing a well to seismic tie through the generation of a synthetic.

15   11. The program storage device of claim 8, wherein the extracting step (c) of extracting seismic attribute data from various zones of said seismic events comprises the step of generating seismic variance and dominant frequency attributes.

12. The program storage device of claim 11, wherein the identifying step (c) of

20   identifying frequency anomalies by interpreting the extracted seismic attribute data for said various zones of said seismic events comprises the steps of:

posting attribute values on a ribbon posting map; and

25   examining these values for rapid shifts in frequencies from higher to lower frequencies.

13. The program storage device of claim 8, wherein the identifying step (d) of identifying and removing any potential false positive frequency anomalies comprises the steps of:

30   extracting and examining a dominant frequency for a near surface seismic event; and

comparing said dominant frequency with the dominant frequencies of the zone(s) of interest.

5 14. The program storage device of claim 8, wherein the confirming step (e) for confirming any remaining ones of said anomalies not removed during the removing step and ranking the remaining confirmed anomalies comprises the step of:

extracting and examining the seismic frequency spectrums from selected zones above,
10 below and including any frequency attenuation zones.

15. A fracture trend identification system adapted for analyzing compressional 2-D seismic data to identify zones containing open natural fractures, comprising:

15 apparatus adapted for identifying seismic events that correspond to a formation of interest;

apparatus adapted for extracting seismic attribute data from various zones of said seismic events;
20

apparatus adapted for identifying frequency anomalies by interpreting the extracted seismic attribute data of said various zones of said seismic events;

apparatus adapted for identifying and removing any potential false positive frequency
25 anomalies; and

apparatus adapted for confirming any remaining ones of said anomalies not removed and ranking the confirmed ones of the remaining anomalies.

16. The fracture trend identification system of claim 15, wherein the apparatus adapted for identifying seismic events that corresponds to a formation of interest comprises:

apparatus adapted for extracting a seismic wavelet, and

5

apparatus adapted for performing a well to seismic tie through the generation of a synthetic.

17. The fracture trend identification system of claim 15, wherein the apparatus adapted

10   for extracting seismic attribute data from various zones of said seismic events comprises: apparatus adapted for generating seismic variance and dominant frequency attributes.

18. The fracture trend identification system of claim 15, wherein the apparatus adapted for identifying frequency anomalies by interpreting the extracted seismic attribute data

15   from said various zones of said seismic events comprises:

apparatus adapted for posting attribute values on a ribbon posting map; and

apparatus adapted for examining these values for rapid shifts in frequencies from higher

20   to lower frequencies.

19. The fracture trend identification system of claim 15, wherein the apparatus adapted for identifying and removing any potential false positive frequency anomalies comprises:

25   apparatus adapted for extracting and examining a Dominant Frequency for a near surface seismic event; and

apparatus adapted for comparing said Dominant Frequency with the Dominant Frequencies of the zone(s) of interest.

30

20. The fracture trend identification system of claim 15, wherein the apparatus adapted for confirming any remaining ones of said anomalies not removed and ranking the confirmed ones of the remaining anomalies comprises:

5   apparatus adapted for extracting and examining the seismic frequency spectrums from selected zones above, below and including any frequency attenuation zones.